



## PATENT COOPERATION TREATY

## PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference INT1076MAJR		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/ZA0200212	International filing date (day/month/year) 17.12.2002	Priority date (day/month/year) 03.01.2002	
International Patent Classification (IPC) or both national classification and IPC E21C37/14			
Applicant VAN DYK, Andre			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 2 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand  01.08.2003		Date of completion of this report  30.10.2003	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer  Ott, S Telephone No. +49 89 2399-7429 	

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**International application No. **PCT/ZA02/00212****I. Basis of the report**

1. With regard to the elements of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-10 as originally filed

**Claims, Numbers**

1-8 received on 01.08.2003 with letter of 30.07.2003

**Drawings, Sheets**

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**International application No. **PCT/ZA02/00212**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1-8
	No: Claims	
Inventive step (IS)	Yes: Claims	1-8
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-8
	No: Claims	

2. Citations and explanations

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/ZA02/00212

POINT V

V-1. D1: WO-0165199 discloses an apparatus for breaking rock which includes a cartridge (12) which forms an enclosure, a propellant inside the enclosure (p.9, l.24), and at least one electrical match (p.8, l.18-20, p.9, l.23-25).

The subject-matter of claim 1 differs from the disclosure of D1 in that the apparatus includes at least one element which is electrically energisable, which is made from inert material exposed to the propellant and which when energised, initiates combustion of the propellant to release high pressure material inside the cartridge.

The electrical match of D1 is comprised of an initiator 32 which generates a flame, when the initiator 32 is itself initiated by a hot spot 34 of the electrical lead connected to a power source. The electrical lead 34 itself does not initiate combustion of the propellant. The initiator 32 itself does not initiate combustion of the propellant when electrically energised.

No document of the prior art discloses nor suggests this difference and the subject-matter of claim 1 does therefore meet the requirements of novelty, inventive step and industrial applicability in the sense of Art. 33 PCT.

V-2. The subject-matter of dependent claims 2-8 does also meet the requirements of novelty, inventive step and industrial applicability in the sense of Art. 33 PCT.

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CLAIMS

1. Apparatus for breaking rock which includes a cartridge which forms an enclosure, a propellant inside the enclosure, and at least one element which is electrically energisable, which is made from inert material exposed to the propellant and which, when energised, initiates combustion of the propellant to release high pressure material inside the cartridge.
2. Apparatus according to claim 1 wherein the element is made from a material selected from carbon, graphite, aluminum, and nickel-chrome.
3. Apparatus according to claim 1 or 2 wherein the cartridge is made from a malleable material and includes a cylindrical side wall, a base and a domed end which opposes the base.
4. Apparatus according to any one of claims 1 to 3 which includes electrical leads which extend from terminals on an outer side of the cartridge to the element.
5. Apparatus according to claim 4 which includes a removable closure which covers the terminals.
6. Apparatus according to any one of claims 1 to 5 which includes a substrate on which the element is mounted and which is embedded in the propellant.
7. Apparatus according to claim 6 which includes a control device, for controlling operation of the element, on the substrate.

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EP02796159.8 - PCT/ZA 02/00212

8. Apparatus according to any one of claims 1 to 7 wherein the element is in the form of an elongate filament.

